

IN THE CLAIMS:

Please amend the claims as follows:

Claim 1 (Currently Amended): A method of detecting protrudent matters adhered on an outside of a connected work member of a plurality of metallic materials wherein the connected work member is formed by connecting the plurality of metallic materials and the protrudent matters are caused by the connection of the plurality of metallic materials, the method, comprising:

a photographing process for photographing the connected work member by a photographing instrument to generate a photographic image;

a confirmation process of making an outside outline of the connected work member (also called as "outline of the work to be detected" hereafter) in the photographic image correspond to a range including a non-allowable range not allowing existence of the protrudent adhered matters and confirming presence or absence of the existence of the outline of the work to be detected in the non-allowable range; and

a judging process of judging that the protrudent adhered matters exist on the outside of the connected work member when the existence of the outline of the work to be detected in the non-allowable range is confirmed in the confirmation process;

each of the plurality of the metallic materials includes a circular column portion, and the connected work member is formed by arranging and connecting the plurality of metallic materials coaxially;

making, in said confirmation process, correspondence between the outline of the work to be detected and a range including the non-allowable range in said photographic image, and confirming, in the corresponding photographic image, presence or absence of the existence of the outline of the work to be detected in the non-allowable range;

in advance deciding the non-allowable range on the basis of the outside outline (also called as “outline of the reference work” hereinafter) of a reference work material to be a reference of the connected work member;

previously setting, in the confirmation process, a detecting line as a boundary between the non-allowable range and an allowable range for allowing the existence of the outline of the reference work neighboring the non-allowable range on the basis of the outline of the reference work, making the correspondence between the detecting line and the outline of the work to be detected in the photographic image, and confirming whether or not the outline of the work to be detected exists on the detecting line; and

in the confirmation process, making correspondence between the outline of the work to be detected and the detecting line in the photographic image, and confirming, in the photographic image, whether or not the outline of the work to be detected exists on the detecting line;

wherein the connected work member is formed to be axial, and when projecting toward an imaginary plan in parallel to a central axial line of the connected work member, the outline of the work to be detected in an orthogonal image is linearly symmetrical with respect to the central axial line (also called as “image central axial line” hereinafter) of the connected work member on the orthogonal image;

wherein in case one side concerning the image central axial line of the outline of the work to be detected of the linear symmetry is a first side and the other side is a second side, mutually symmetrical reference points are respectively set in the first side and the second side, and an ordering point (also called as “the ordering point of the first side detecting line” hereinafter) is determined for ordering a position of the first side on the basis of a reference point (also called as “the first side reference point” hereinafter) of the first side, and

the positional relation between the first side reference point and the ordering point of the first side detecting line, as well as the positional relation between the second reference point and the ordering point (also called as “the ordering point of the second side detecting line” hereinafter) for prescribing the detecting line in the second side based on the second side reference point, are automatically settled to be symmetrical with respect to the central axial line on the basis of the first side reference point, the second side reference point and the ordering point of the first side detecting line;

wherein the photographing process rotates the connected work member per each of fixed angles around the rotation axial line of the central axial line, creates the photographic image of the connected work members in the respective angles, and performs the confirmation process in the respectively created photographic images.

Claims 2-5 (Cancelled).

Claim 6 (Currently Amended): The method of detecting the protrudent adhered matters as set forth in claim 1 ~~4 or 5~~, comprising:

setting a reference point to be a positioning reference of the detecting line corresponding to the outline of the work to be detected in a prescribed position on the outline of the work to be detected, and positioning the detecting line to the outline of the work to be detected on the basis of the reference point.

Claim 7 (Currently Amended): The method of detecting the protrudent adhered matters as set forth in claim 1 ~~4 or 5~~, comprising:

determining reference points per members in the plurality of metallic materials connected as elements of the connected work members, and positioning the detecting line per each of the metallic materials on the basis of the reference points per members.

Claim 8 (Original): The method of detecting the protrudent adhered matters as set forth in claim 7, wherein

said plurality of metallic materials include two metallic members of different diameters, and in regard to at least one of these two metallic materials, a position of changing the diameter in the outline of the work to be detected is determined as a reference point per member.

Claims 9-11 (Cancelled).

Claim 12 (Currently Amended): The method of detecting the protrudent adhered matters as set forth in ~~any one of claims~~ claim 1 to ~~11~~, wherein, in the outline of the reference work, a height H_1 (also called as “the allowable height H_1 ” hereafter) allowing the protrudent adhered matters to exist is in advance decided, and in case L is the distance between the outline of the reference work and the detecting line, the relation between the allowable height H_1 and the distance L is decided to satisfy $0.3 \leq L/H_1 \leq 0.9$.

Claim 13 (Currently Amended): The method of detecting the protrudent adhered matters as set forth in ~~any one of claims~~ claim 1 to ~~12~~, wherein the connected work member is made by connecting the plurality of metallic materials by a laser weld or a resistance weld.

Claim 14 (Currently Amended): A method of making spark plugs, comprising a process of detecting the protrudent adhered matters by use of the method of detecting the protrudent adhered matters as set forth in ~~any one of claims~~ claim 1 to ~~13~~, and

a post-treating process for carrying out the post-treatment on the basis of detected results obtained by the detecting process of the protrudent adhered matters.